Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
For
Berkshire Country Day School, Inc.

What is SWAP?

The Source Water Assessment and Protection (SWAP) program, established under the federal Safe Drinking Water Act, requires every state to:

- Inventory land uses within the recharge areas of all public water supply sources;
- Assess the susceptibility of drinking water sources to contamination from these land uses; and
- Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
January 6, 2004

Table 1: Public Water System (PWS) Information

PWS Name	Berkshire Country Day School, Inc.
PWS Address	State Route 183
City/Town	Stockbridge, Massachusetts
PWS ID Number	1283013
Local Contact	Mr. William Enser
Phone Number	413-243-1416

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well No. 1	1053007-01G	155	452	High

Introduction

We are all concerned about the quality of the water we drink. Drinking water supplies may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination, the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses in the Protection Areas
3. Protection Recommendations
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Berkshire Country Day School, Inc. is located in the small, rural town of Stockbridge, in southwestern Massachusetts on State Route 183. The school is located immediately south of the Lenox town line. The school has a student and staff population of approximately 340 people. Although there is a municipal water system and wastewater treatment plants in both Stockbridge and in Lenox, they do not serve this section of town. Therefore, the school water is supplied through one on-site well and wastewater is discharged to an on-site septic system.

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by the water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

The Zone I protection area for a well is the area immediately around the well that is considered most vulnerable to contamination. The Interim Wellhead Protection Area (IWPA) provides an interim protection area for a water supply well when the actual recharge area (Zone II) has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The DEP allows only activities related to supplying water or other non-threatening activities within the Zone I. Many systems that were developed prior to the DEP requirements are grandfathered, but any expansion or changes to the facility require DEP approval and compliance with Zone I restrictions.

The school's well is located immediately adjacent to a soccer field, within 50 feet of one of the school buildings and within 20 feet of a brook. In the late 1990's the school constructed the soccer field and added and expanded buildings within the Zone I of Well #1. The DEP allowed the school to continue using the non-conforming Well #1, but required the school to decrease their water use to 1,250 gallons per day and to provide an alternate water source either by developing a conforming well through the New Source Approval Process or by connecting to an existing, adjacent municipal/public water supply. The school signed an Administrative Consent Order agreeing to these conditions. To date, the school has not reduced their water use, and has not developed a conforming well or secured an agreement to connect to a municipal/public water supply source.

The geologic mapping of the area indicates varying thickness of overburden material, primarily till, with numerous exposures of bedrock in the upland areas. Geologic mapping indicates a complex series of folds and faults within the Taconic-Berkshire Zone. The primary bedrock mapped in the vicinity of the school is the Wollumsac Formation, phyllite with limestone. Mapping indicates a dark grey calcitic schistose marble.

As noted, the DEP established the school well Zone I and IWPA protection area radii are 115 and 428 feet, respectively, based on the required maximum water use of 1,250 gallons per day. However, a review of the annual statistics reports from 1998 through 2002 showed the average daily water use for the two highest months of water use during that period was approximately 2,316 gallons per day. **Therefore, the DEP herein is reestablishing the Zone I and IWPA for Well #1 based on reported water use. The Zone I and IWPA protection area radii for that volume of water use are 155 feet and 452 feet, respectively.** The Zone I protection area of 155 feet

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	-	-	-	Contact DEP prior to expanding the facility or conducting any work in the Zone I.
Fuel storage (AST/UST)	Yes	Yes	Moderate /High	Spills, leaks, or improper handling of fuel oil
Transportation corridors and parking	Yes	Yes	Moderate	Be sure emergency responders are aware of the location of your wells.
School	Yes	Yes	Moderate	Continue policy of not using pesticides and fertilizers. Manage septic system and facilities.
Floor drain in boiler room	No	Yes	Moderate	Contact UIC coordinator in the region to discuss compliance.

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

includes many activities that pose a potential risk of contamination to the well such as the school's buildings and fuel storage tanks. The remainder of the school facilities including the 10,000-gallon underground fuel oil storage tank, parking, the school and headmaster's house leachfields are located within the IWPA of the well.

The water supplied to the school is not treatment at this time. The DEP requires public water suppliers to routinely monitor the quality of the water. For current information on monitoring results, please contact the Public Water System contact person listed above in Table 1. Drinking water monitoring reporting data is also available on the web at http://www.epa.gov/enviro/html/sdwis/sdwis_query.html, EPA's Envirofacts website.

2. Discussion of Land Uses in the Protection Areas

There are numerous land uses and activities within the drinking water supply protection areas that are potential sources of contamination.

Key issues include:

1. **Non-conforming Zone I;**
2. **School facilities and athletic field;**
3. **Fuel storage tanks (UST/AST);**
4. **Floor drain in boiler room; and**
5. **Transportation and parking.**

The overall ranking of susceptibility to contamination for the wells is high, based on the presence of at least one high threat land use or activity in the protection areas, as seen in Table 2.

1. Non-conforming Zone I – Currently, the well does not meet DEP's restrictions, which require the system to own or control the entire Zone I area and allow only water supply related or other non-threatening activities in Zone I.

Recommendations:

- Comply with the current requirements to provide an alternate source of water.
- Do not allow any new non-water supply activities in the Zone I.
- Monitor and control all activities near the well.
- Monitor all fuel deliveries.

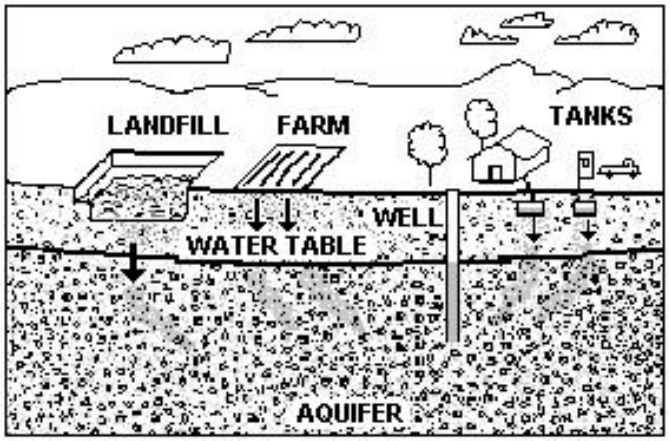

Figure 1: Example of how a well could become contaminated by different land uses and activities.

2. School facilities and athletic fields – Elementary schools generally use only household hazardous materials for cleaning. There are state and federal regulations controlling some of the activities and products used at schools to promote "healthy schools". All of the school's facilities are located within the Zone I or IWPA of the well, including fuel oil tanks, parking, septic components and leachfields. Stormwater may also pose a risk. Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from parking areas and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents.

For More Information:

Contact Catherine Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier and town boards.

Recommendations:

- Continue the use of Best Management Practices for all activities at the school and at the athletic fields. Consider drought resistant grasses and/or low release nutrient fertilizers in the IWPA, as required. Do not use fertilizers and pesticides in the Zone Is.
- Investigate Integrated Pest Management and Best Management Practices within the IWPA as necessary.
- Use secondary containment for any petroleum products kept for maintenance and lawn care equipment.
- Use Best Management Practices for handling treatment chemicals and vehicles used to access the area. Do not use or store pesticides, fertilizers or deicing materials within Zone I.
- Review your emergency response plan regarding accidental releases within the area. Ensure that emergency responders in town are aware of the locations of your resource areas.
- Promote BMPs for stormwater management and pollution controls.
- Improper disposal of household hazardous chemicals to septic systems is a potential source of contamination to the groundwater because septic systems lead to the ground. If septic systems fail or are not properly maintained, they could be a potential source of microbial contamination.
- Refer to the Massachusetts Public Health Association's Healthy Schools website for additional information, online at http://www.mphaweb.org/pol_schools.html.

3. Fuel Storage Tanks– Underground/Aboveground Storage Tank (UST/AST) – If managed improperly, underground fuel oil storage tanks and the associate fuel oil lines can be a potential source of contamination due to leaks or spills of the chemicals they store. The fuel oil lines from the UST to the buildings it serves are sleeved to protect against leaks in the lines. In addition, there is an AST fuel oil tank in the basement of the Administration Building boiler room along with a sump pump that reportedly discharges to the septic system. The school also has propane USTs that do not pose as significant a threat as the fuel oil UST.

Recommendations:

- Any modifications to the UST/AST must be accomplished in a manner consistent with Massachusetts' plumbing, building, and fire code requirements. Consult with the local fire department for any additional local code requirements regarding USTs.
- Monitor deliveries of oil as many spills are related to delivery.
- Containment of the fuel system to prevent accidental releases to the floor is important. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. DEP recommends that you require that your boiler maintenance contractor use containment, protect the well and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

4. Floor Drain in Boiler Room – There is a floor drain in the boiler room in the Administration building that reportedly discharges to the septic system; there is also an AST fuel oil storage tank in the basement. Title 5 prohibits disposal of any wastewater other than sanitary waste to a septic system and the UIC regulations prohibit dry wells in areas where hazardous materials or petroleum may enter the floor drain. The floor drain must be protected to prevent boiler blow down, oil or other prohibited discharges through the floor drain.

Recommendations:

- Be sure that the floor drains are in compliance with Department Regulations (refer to Industrial Floor Drain Brochure attached).
  - Contact the UIC coordinator for the Western Region Office of the Department (Rick Larson 413-755-2207).
- Containment to prevent accidental releases to the floor drain may be an option. Contact the regional DEP contact for the

UIC program listed above. Oil lines from the tank to the boiler should be sleeved so that any leaks would drain back to the tank or minimal oil would leak to the boiler room. Prepare a policy and a plan for maintenance operations, especially when oil filters are changed. We recommend that you require your boiler maintenance contractor use containment, protect the drain and have absorbent materials on hand to prevent accidental leaks while conducting routine maintenance. The contractor should be responsible for the off-site disposal of any boiler blow down generated during maintenance.

- Determining the discharge location of the drains. Seal all cracks in the floor and the floor drain if it is not needed to protect the building from flooding and if it cannot be adequately protected to prevent a prohibited discharge.

5. Transportation corridor and parking – Internal roadways and facility parking are located within the Zone I and IWPA. Accidents and normal use and maintenance of corridors and parking areas may pose a potential threat to water quality. Catch basins transport stormwater from roadways and adjacent properties to the ground, streams, rivers or reservoir. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills, as well as, waste from wildlife and pets.

Recommendations:

- Prepare an Emergency Response Plan that includes coordination among town emergency responders to be sure they are aware of the location of your well.
- Continue to manage on–site stormwater to ensure it flows away from the well.

In addition, at the time of the assessment, the DEP noted three pole-mounted transformers within the Zone I that appeared to be relatively old and did not carry a label identifying them as being free of PCBs. If those transformers have not yet been replaced, contact the local utility company and request that they confirm the transformers are in compliance with current requirements or have them replaced.

Implementing the following recommendations will reduce the system's susceptibility to contamination.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will reduce the well's susceptibility to contamination. The school is commended for utilizing propane for one building's fuel source, however there are significant threats that need to be addressed at the school. The water supplier should review and adopt the key recommendations above and the following:

Priority Recommendations:

- ✓ Provide an alternate water source for the facility as required.
- ✓ Monitor fuel oil delivery and activities within close proximity to the wells. Do not use or store hazardous materials in the vicinity of the wells.

Zone I:

- ✓ Keep all new non-water supply activities out of the Zone I.
- ✓ Post the area with "Public Drinking Water Supply Recharge Area" signs at appropriate locations away from the actual wells.
- ✓ Monitor all existing activities within the Zone I.
- ✓ Inspect the well and the cap regularly. Ensure the cap is watertight and secure and that there is no standing water at the well.

Training and Education:

- ✓ Train staff on proper hazardous material use, disposal, emergency response, and best management practices; include custodial staff, groundskeepers, certified operator, and food preparation staff. Post labels as appropriate on raw materials and hazardous waste.
- ✓ Incorporate groundwater education into the school curriculum and community.
- ✓ Work with your community to ensure that stormwater runoff is directed away from the area and is treated according to DEP guidance.

Facilities Management:

- ✓ If it is feasible in the future, consider upgrading all of heating systems to propane for the purpose of removing fuel oil storage from the school.
- ✓ Implement Best Management Practices (BMPs) for the use of fertilizer, herbicides and pesticides on school property.
- ✓ Keep the area near transformers free of tree limbs that could endanger the transformer in a storm.
- ✓ Contact the UIC coordinator to address any floor drains in areas where hazardous materials could discharge to the ground or to a septic system.

Planning:

- ✓ Work with local officials in town to develop an Aquifer Protection District with bylaws and include the facility's IWPA in the District, along with other public water supply wells in town and to assist you in improving protection.
- ✓ Have a plan to address short-term water shortages and long-term water demands. Keep the phone number of a bottled water company readily available.
- ✓ Supplement the SWAP assessment with additional local information and incorporate it into water supply educational efforts. Use a land use inventory to assist in setting priorities, focusing inspections, and creating educational activities.

Funding:

The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". If funding is available, each program year the Department posts a new Request for Response for the Grant program (RFR). Other funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Areas
- Recommended Source Protection Measures Fact Sheet